

BENCHMARKS

VOLUME 6 NUMBER 1 NORTH TEXAS STATE UNIVERSITY JANUARY 1985

*BENCHMARKS was produced using WordstarTM

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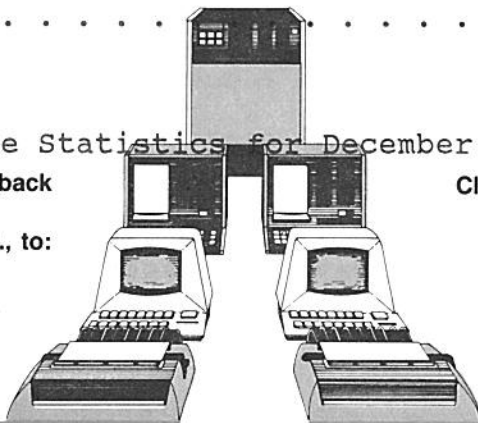
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BENCHMARKS Reader/User feedback
is encouraged.

Send all letters, suggestions, etc., to:
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Services Available to Users of the NTSU Computing Facilities

The NTSU Computing Center is located in the Information Sciences Building, Room 119. Telephone: (817) 565-2324. HELP DESK phone: 565-4050.

INFORMATION AND ID CODES - Carolyn Goodman

BENCHMARKS QUESTIONS/CONTRIBUTIONS, ETC. - Claudia Lynch

STATISTICAL/RESEARCH SUPPORT - George Morrow, Scott Barber,
Claudia Lynch, Dave Molta, Panu Sittiwong

STUDENT PROGRAMMING PROBLEMS - CSCI Department, Room 542A, GAB
BCIS Department, Room 152, BA

JCL PROBLEMS - Help Desk

PRE-RESEARCH COUNSELING - George Morrow, Scott Barber, Dave Molta,
Panu Sittiwong, Claudia Lynch

DATA ENTRY & KEYPUNCH - Betty Grise

TEST SCORING & ANALYSIS - Betty Grise

DISK SPACE PROBLEMS - Carolyn Goodman

PASSWORD AND OPERATING SYSTEM PROBLEMS - Help Desk

ADMINISTRATIVE APPLICATIONS - Coy Hoggard

COMMUNICATION/TERMINAL PROBLEMS - Help Desk

PRINTOUT RETRIEVAL - RJE Operators

Spring Computing Hours

Computing facilities will be open during the following hours throughout the Spring Semester (not applicable to holidays):

Computing Center RJE:	7 a.m. Monday - Midnight Saturday Sunday, Noon - Midnight
ISB 110 Terminal Area:	Monday - Thursday, 7:30 a.m. - Midnight Friday, 7:30 a.m. - 6 p.m. Saturday, 9:00 a.m. - 7 p.m. Sunday, 2 p.m. - 10 p.m.
College of Business:	Monday - Thursday, 8:15 - Midnight Friday, 8:15 - 8 p.m. Saturday, Sunday, 12:15 p.m. - Midnight
Room 550C, GAB:	Saturday, CLOSED Sunday, 2 p.m. - 11 p.m. Monday - Thursday, 8 a.m. - Midnight Friday, 8 a.m. - 8 p.m.

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*   P R O C E D U R E S ,
*   A N D   O T H E R
*   I M P O R T A N T
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Execptions to Scheduled Hours for GAB 550C

Due to limited space, the entire schedule for GAB 550C could not be printed on the previous page. Following are some exceptions to the preceding reported hours:

<u>Days</u>	<u>Dates</u>	<u>Status</u>
Sunday	Jan. 20, March 17	CLOSED
Monday -	Jan. 21-24, May 6-9	OPEN 8 am - 10 pm
Thursday	March 18-21	OPEN 11 am - 8 pm
Friday	March 15, May 10	OPEN 8 am - 5 pm
	March 22	OPEN 11 am - 5 pm
Saturday	March 3, April 28	OPEN Noon - 8 pm

SIMS Project Status Report: 1/16/85 By Coy Hoggard, Manager Information Systems

SIMS (Student Information Management System) is a very large software system marketed by Information Associates (IA). "SIMS" is actually a local term. The vendor, IA, markets different modules of the system separately. The modules (or sub-systems) that NTSU has purchased are as follows:

- AMS - Admissions Management System.
- BRS - Billing / Receivables System.
- FAMS - Financial Aid Management System.
- SRS - Student Records System.

The software has been modified to meet NTSU's needs. One major requirement was that the sub-systems function together as an integrated system rather than as four independent modules. Another requirement was that the system be converted to our operating environment (MVS / ADABAS / COM-LETE). In addition to these requirements, NTSU's operating policies and procedures required numerous functional modifications to the system. Most of the conversion to ADABAS / COM-LETE was provided by IA, although the actual work was accomplished by a third party contractor; Todd, Bennett, and Blair. Most of the modifications to meet NTSU's functional requirements are being accomplished locally by Computing Center staff.

To date, the SRS, BRS, and a part of the AMS modules of the system are functional. A significant amount of work remains to be done to interface this software to other existing NTSU software systems, to provide additional reporting and overall functionality, etc. Implementation of the FAMS module is scheduled for this semester (i.e., Spring '85).

Certainly the most visible part of the system is the registration process. Early registration was an option for students who were enrolled in the Fall, '84 semester. This occurred in October. A two day add-drop period was available January 7-8 for students who had taken advantage of early registration but wanted to revise their schedules. This was followed by three and one-half days of "regular" registration, beginning the afternoon of January 9 and continuing through Saturday, January 12. Late registration began on Monday, January 14 and continues through Wednesday, January 16. Schedule changes (add-drop) are also handled during this period.

While early registration is a batch process, student add-drop, "regular" registration, and late registration are accomplished in the on-line mode. This activity occurs in the coliseum and is accomplished by the use of approximately 40 terminals, 6 printers, and 4 scanners (optical mark readers), all on-line to the NAS 6650 in the GAB. These devices were used to electronically schedule classes, post financial aid/waivers, and to calculate tuition and other fees. The equipment was moved to the coliseum from various campus offices prior to registration. The Local Area Network (LAN) provides data communications between these devices and the host computer.

From a functional point of view, our first registration using the SIMS software went very well. The hardware, software, and communications link all operated essentially as planned. Problems experienced were system overload problems and lack of terminal availability in many academic units. Hopefully we will be able to improve this situation before our next registration. Workload and performance data are still being evaluated, but preliminary indications are that a student flow of up to 400 students per hour can be accommodated without significant system response time degradation. We experienced surges in excess of 600 students per hour, causing a system overload and, thus, lines in registration.

The Computing Center Open House: Be There!

The NTSU Computing Center will be hosting the Open House for the Spring semester on Wednesday January 30, from 9:00 am until 7:00 pm. The purpose of our Open House is to provide a chance for users to tour the Computing Center facilities. Reservations should be made by calling or stopping by the Computing Center main office in room 119 of the Information Sciences Building (ph. 565-2324).

This is a great opportunity for faculty members to bring classes to tour the facilities. Staff members and student groups are also welcome. Tours will not be offered at any other time during the semester. The maximum group size for a tour is 15 people, so large classes should split up and make reservations for several consecutive tours.

The total tour is about 25 minutes long. Tours will be offered at 20 minute intervals. You will begin in the ISB output area where the laser printer and other output devices are located. The tour then moves to the fifth floor of the GAB where you will view the mainframe machine room and VAX machine room.

We invite you to take advantage of this opportunity to view the computing facilities at NTSU.

SPSS-X Test Release Brings New Procedures, Program Fixes

For the next month or so the product you get when you execute SPSSX will be a test release called 2.1 A. NTSU has agreed to be a test site for this version of SPSSX which has a new UPDATE facility, a GETSAS procedure for direct access of SAS files, new string functions, the ability to read column binary files, a new TABLES procedure and a TOSPPSS procedure which converts SAS data sets to SPSS-X system files or portable files. We have also installed a version of LISREL which is compatible with this release. Many "bugs" that existed in the previous version of SPSS-X (2.0) have been fixed in this version as well. Should you feel uncomfortable using a test release, or have some question about the agreement of results from this version to the older version of SPSS-X which we have been running, you may still access version 2.0 by executing OLDSPSSX instead of SPSSX.

Since this is a test release, it is extremely important that you report any problems you are having to us in Academic Computing (565-2324) - don't call SPSS Inc. yourself. We will determine if the trouble is with the user or the product and take the appropriate action.

The following public files have been added to the system, should you need to use them:

SYS2.SPSSX21.ELECTRIC	SYS2.SPSSX21.BANK
SYS2.SPSSX21.GSS82	SYS2.SPSSX21.PRODUCTS
SYS2.SPSSX21.ALMANAC	SYS2.SPSSX21.GUITAR
SYS2.SPSSX21.STUB	SYS2.SPSSX21.USRDUMMY
SYS2.SPSSX21.CMNUSR.FORTRAN	SYS2.SPSSX21.CMNPAR.FORTRAN
SYS2.SPSSX21.CMNSET.FORTRAN	SYS2.SPSSX21.CMNUSR.COBOL
SYS2.SPSSX21.CMNPAR.COBOL	SYS2.SPSSX21.CMNSET.COBOL

New Message Facility Available on MUSIC

A new message facility is now available on MUSIC. Oddly enough, it is called "MSG." It allows users to send one-line messages to each other. The syntax of the command is:

MSG IDCD TEXT

where MSG is the command, IDCD is the receiver's userid, and TXT is the message. For help with this command, type MSG without any operands or HELP MSG while logged-on to MUSIC. NOTE: You can send a message to yourself if you like, just to see how it works.

MUSIC/SCRIPT - Waterloo/SCRIPT Compatability
By Claudia Lynch, Editor

MUSIC/SCRIPT and Waterloo/SCRIPT share a common ancestor, an IBM product called, appropriately, SCRIPT. It is no surprise, then, that many commands are common to both text processors and their basic logic is the same. Waterloo/SCRIPT is the more evolved of the two, therefore it is much easier to translate MUSIC/SCRIPT files into Waterloo/SCRIPT files than vice versa. In fact, many MUSIC/SCRIPT commands will cause the same things to happen in Waterloo/SCRIPT, even though they are not documented anywhere in the Waterloo/SCRIPT manuals.

Of all the MUSIC/SCRIPT commands, the following are the only ones that I have found to be incompatible with Waterloo/SCRIPT:

Command	Function	Waterloo/SCRIPT Equivalent
1. .(.)	Text Groups	.CC - Conditional Column
2. .DF	User Defined Commands	.DM - Define Macro
3. .ZN	Zone	NONE
4. .MF	Modification Flag	NONE
5. .OX	Output Auxiliary	NONE
6. .TS	Tab Substitute	.DC TB - Define Character Tab
7. .UL MASK	User Draws Underlines	.UD - Underscore Definition

If you have encountered other problems in translating MUSIC/SCRIPT files into Waterloo/SCRIPT or have had any other insights about this endeavor, I would appreciate hearing from you.

Computing Center Spring Short Courses

The Computing Center is offering a series of short courses during the Spring semester. These courses will be held in Room 110 of the Science and Technology Library (ISB) unless otherwise noted. Following are the dates and times for each course. Please pre-register to attend. Only 20 people will be admitted per section. Courses marked with * require knowledge of the MUSIC Context Editor. Courses marked with ** require familiarity with VMS and EDT gained from the computer assisted instruction courses VMSCAI

and EDTCAI. THE COMPUTING CENTER RESERVES THE RIGHT TO CANCEL COURSES WITH LESS THAN 5 PEOPLE SIGNED UP.

1. Four separate 2-hour introductory sessions on the MUSIC interactive operating system.

Monday, February 11	:	3 - 5 p.m.	Instructor: Janice Green
Tuesday, February 12	:	9:30 - 11:30 a.m.	Instructor: Janice Green
Wednesday, February 13	:	10 a.m. - Noon	Instructor: Janice Green
Friday, February 15	:	2 - 4 p.m.	Instructor: Janice Green

2. Three separate 1-hour sessions on the use of the 3270 Protocol Converter to do FULL-SCREEN EDITING on MUSIC.*

Tuesday, February 12	:	4 - 5 p.m.	Instructor: Dave Molta
Wednesday, February 13	:	1 - 2 p.m.	Instructor: Panu Sittiwong
Friday, February 15	:	10 - 11 a.m.	Instructor: Dave Molta

3. Two 1-hour introductory sessions on the VAX minicomputers.**

Tuesday, February 12	:	1 - 2 p.m.	Instructor: Kim Stickney
Friday, February 15	:	1 - 2 p.m.	Instructor: Kim Stickney

4. A 2-hour introductory session on SPSS-X.*

Wednesday, February 13	:	3 - 5 p.m.	Instructor: Dave Molta
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5. A 2-hour introductory session on SAS.*

Thursday, February 14	:	9:30 - 11:30 a.m.	Instructor: Scott Barber
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6. A 2-hour introductory session on Waterloo/SCRIPT.*

Thursday, February 14	:	6 - 8 p.m.	Instructor: Claudia Lynch
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7. A 2-hour advanced session on SAS.*

Monday, February 11	:	6 - 8 p.m.	Instructor: Panu Sittiwong
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8. A 2-hour introductory session on BMDP.*

Thursday, February 14	:	1:30 - 3:30 p.m.	Instructor: Bob Brookshire
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9. A 2-hour session on Job Control Language (JCL) - To be held in the Academic Computing Services Conference Room ISB 123 (in the Computing Center Office Area).

Friday, February 15	:	1 - 3 p.m.	Instructor: George Morrow
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A sign-up sheet for these short courses is included at the end of this issue.

Disk Dataset Names

By Claudia Lynch, Editor

Once again I have been asked to remind you of the naming conventions for OS disk datasets. It is: USER.IDnn.filename

where: USER. - must appear
 IDnn - is your User ID and must appear
 . - must appear
 filename - is one or more optional fields (each of
 which may not exceed 8 characters)
 separated by periods.

There are a lot of people who are still using User1 and User2, which are no longer acceptable. If you do not comply with the naming convention outlined above, your dataset(s) will be deleted from the disk(s) without warning. The following job will rename a disk file for you:

```
//IDIDname JOB (IDID,:05,1),'your name',PASSWORD=yourpassword
// EXEC IEHPROGM
  RENAME DSNAME=old.data.set.name,VOL=SYSDA=volumnname,          *
          NEWNAME=USER.IDID.newname
          ↑
        (col. 16)                                         (col. 72) ↑
```

Wondering About The Survey?

By Scott Barber, Academic Computing Services Staff

In previous issues of BENCHMARKS, you may have noticed a couple of blurbs about a Computing Center survey which is "coming soon". In order to avoid too much similarity with the "Free Johnny Dangerously" marketing approach, I want to provide some words of explanation on this project so that you will be informed as to the background justifications, objectives, and methods to be employed in relation to this effort. To that end, this article describes the framework for this preliminary analysis of the perceptions of the NTSU academic community regarding these issues.

In order to provide the most effective computing services to the academic community at NTSU, the Computing Center must actively solicit feedback from that community. In order for this feedback to be maximally beneficial, it should include information on such issues as community awareness, accessibility, and effectiveness of services provided; the relevance of those services for continually changing needs; and the identification of services which are not presently available, but which would promote the use of computing resources on campus and enhance the usefulness of those resources for the academic community.

With these issues in mind, a survey of the academic user community at NTSU will be conducted, with particular focus on three distinct populations: 1) undergraduate students,

2) graduate students, and 3) faculty. A census will be taken of all graduate student and faculty account holders on the academic mainframes at NTSU, including the NAS 8043 and the VAX A and VAX B systems. These populations are not deemed prohibitively large, and are likely to provide extremely useful data for the analyses.

The undergraduate student population will be obtained by sampling "classroom" IDs on the same systems. The exact proportion to be sampled has not been determined, but should be approximately 20-30% of the total number of undergraduates with IDs.

Two separate questionnaires will be prepared, one for graduate students and faculty, and the other for the undergraduate students. The instrument for the undergraduates should require no more than 8-10 minutes for completion, while the faculty and graduate survey should require about 15-20 minutes. Questionnaires will be distributed through the academic departments, and the procedure for the completion and return of these survey instruments will be described in more detail.

For both questionnaires, descriptive information will be solicited in order to identify sub-populations with unique needs, to target various sub-populations in the design of future services, and to get a general picture of the characteristics of the NTSU academic user community in terms of its familiarity with and use of computing resources on campus. Other questions will address the adequacy of presently available services and the perceived need for expanded and/or new offerings.

Introductory letters will be sent to all departments about 10 days before the surveys are delivered. The purpose of the survey will again be explained and the time frame for completion will be outlined. Undergraduate surveys will be distributed to instructors. We will ask that these instructors give the undergraduate respondents approximately 10 minutes to complete the questionnaire during classtime. This will help to insure completion of the instrument in a reasonable amount of time and will also help to support the response rate for this population.

The distribution of this survey questionnaire is scheduled for sometime in February, after things have settled down a bit! Obviously, we encourage you to help with this effort, as it will be a chance for us to know how we're doing, and a good opportunity for you to sound off!!

Missing Something?

Academic Computing has come into possession of three computer tapes of unknown origin. They don't belong to us, and we don't want them. So, if any of them belong to you, or someone you know, come and get them. If not, they will be thrown away. The tapes are as follows:

1. An IBM standard label tape with the volume name SALLY. It contains one file, named SAL, which has about 3,520 records of data. The records are fixed, 80 bytes long. The tape was created in June, 1982.
2. An IBM standard label tape with the volume name HASSAN. It contains five files, named APP, HASSAN, INT, OUTPUT and TITLE. Each file is composed of fixed, 80 byte records. The files vary in length from 80 records to 6,240. The tape was created in May, 1982.
3. A tape with the external label 700331. This tape has a physical label on it which contains the following information:
 "NAME-SFI02.S5529989.KI6RS.TAPE2, NTSU, DATE OF WORK-4/7/83,
 OUTPUT FROM PSFI0720, INPUT TO WSI-OPS, REMARKS- SEND TO WSI,
 K.I.ROBERTS."

If we don't hear anything by March 1, 1985, the tapes will be disposed of.

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Backup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems and their contents is done once every two weeks at some low activity period over a weekend.

NAS/8040 Performance Statistics for December

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
VM/SP3	744	6.23	737.77	6.00	731.77	99.2%
MUSIC	744	31.79	712.21	12.55	699.66	98.2%
MVS/JES2	744	6.38	737.62	8.03	729.59	98.9%
COMPLETEA	744	6.75	737.25	9.17	728.08	98.8%

The AS/8040 CPU and the AS/7360 DASD achieved 100% uptime.
 System Uptime=(Production Hrs Achieved)/(Planned Production Hrs)
 Production Hrs Achieved = (Planned Production)-(Unplanned Maint.)
 Scheduled Operating Hrs = (Planned Maint.) + (Planned Production)
 MUSIC Planned Maintenance Hours include 25.32 hrs system backup.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

CPU, Tape, and Disk Subsystems (NAS)

1. 7350 DASD C.U. Failures	3.14 HOURS
2. Field Change Order Installation on CPU	6.75

TOTAL	9.89 HOURS

Terminal Control Systems (IBM)

1. 3272 TCU Failures	0.21 HOURS

Miscellaneous

1. Undetermined Causes for Systems Restarts	1.53 HOURS
2. VM/SP3 System Tuning/Improvements	1.69
3. MUSIC System Tuning/Improvements	4.07
4. MVS/JES2 System Tuning/Improvements	0.32
5. Emergency Power down of all Equipment due to Water Leakage from Roof in GAB Room 560	4.06

TOTAL	11.67 HOURS

GRAND TOTAL	21.77 HOURS

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*   T E C H N I C A L   *
*   S U P P O R T       *
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Program Hit Parade

By Dan Hood, Technical Support

The following programs were used the most frequently during the month of December.

TOP TEN PROGRAMS IN TERMS OF FREQUENCY OF RUNS

<u>Program</u>	<u>Description</u>	<u>Number of Runs</u>
1. IEWL	Linkage Editor	17915
2. PGM=*.DD	Compiled Program	17607
3. IKFCBL00	VS COBOL Compiler	14047
4. IFOX00	System Assembler	11634
5. IEBGENER	IBM Utility	9718
6. IEFBR14	IBM Null Utility	9222
7. FASTLOAD	Model 204 Utility	6891
8. IEBPTPCH	IBM List Utility	6772
9. SCRIPT	Waterloo Script	6489
10. SASLPA	SAS	5089

TOP TEN PROGRAMS IN TERMS OF CPU SECONDS USED

<u>Program</u>	<u>Description</u>	<u>CPU Seconds</u>
1. PGM=*.DD	Compiled Program	139943
2. SASLPA	SAS	33734
3. IKFCBL00	VS COBOL Compiler	26481
4. IFOX00	System Assembler	22875
5. SPSS	SPSS-X	13139
6. SCRIPT	Waterloo Script	11066
7. FASTLOAD	Model 204 Utility	10994
8. IEWL	Linkage Editor	8921
9. IEL0AA	PL/I Optimizer	3655
10. BATCH204	Batch Database	3555

Technical Support Loses Another Team Member

Dan Hood, who was with the Computing Center as a Technical Support programmer for the past three years, and was the compiler of the monthly "Program Hit Parade," above, has resigned his position to go to work in the private sector. We wish Dan the best of luck in his new position.

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*   C O M M U N I C A T I O N S   *
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Dialing Up NTSU Computers Over the Telephone

Phone numbers for the local area network are:

300/1200 BAUD: (817) 565 - 3300
 3499

300 BAUD: D/FW METRO 429 - 6006

The numbers that will accept either 300 or 1200 baud communications have an autobaud feature that requires the user to hit the <RETURN> key repeatedly until the receiving modem can determine the appropriate baud rate. The METRO telephone number is for 300 baud communications only. After a communications link has been successfully established, the user will receive the # prompt. At this point, it will be necessary to issue the appropriate CALL command to connect with a computer.

CALL 8040 will connect with the 8040
8050 (on which you can access MUSIC)
8060

CALL 8300 will connect with the 8040 at 300 baud

CALL 3270 will connect with the 8040 through the 3270
3280 protocol converter

CALL A780 will connect with VAX system A

CALL B780 will connect with VAX system B

CALL 2000 will connect with the HP-2000 computer

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MUSIC Backup Hours

A message will be sent to all users signed on to MUSIC approximately 10 minutes before backups are begun. It will be in the form * * MUSIC SHUT DOWN AT xxxx AM - SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC, enter HELP HOURS. The following backup schedule is currently in effect:

Tuesday	3 a.m. (for about 3 hours)	Weekly backup
Wednesday - Saturday	4 a.m. (for about 2 hours)	Daily backup
Saturday	Midnight (for about 2 hours)	Daily backup

Full-Screen Editing on MUSIC

By Dave Molta, Academic Computing Services Staff

New users of MUSIC at NTSU usually begin by learning to use the 'line editor' to create and modify files. While the MUSIC line editor is quite versatile and is capable of satisfying most of your needs, many experienced users on campus take advantage of the 3270 protocol converter to enable them to use full-screen editing on MUSIC. The the protocol converter takes a little time to get used to, but you would be hard-pressed to find many users who continue to use the line editor once they've acquired some facility with the full-screen editor.

Technically, the 3270 protocol converter allows an ASCII terminal (i.e., MIME, Televideo) to emulate an IBM 3270 data terminal. For MUSIC users, the biggest advantage is that editing can be accomplished by moving the cursor to a particular line and modifying that line directly without having to use the Change (c/string1/string2/) command. To correct a spelling error, simply type over the text on the screen. To delete a character, position the cursor under the letter and hit the delete key. Other editing capabilities are also enhanced and the user can still use all of the line-editor commands.

GAINING ACCESS

To access MUSIC through the protocol converter, issue the command CALL 3270 from the Local Area Network. The system will respond with:

CALL COMPLETED TO 3270,n (where n is the port number)

At this point, you should press the <RETURN> key. The system will respond with:

ENTER 2-DIGIT TERMINAL TYPE OR TYPE "M" FOR MENU -

The usual response to this prompt is to type the number 02 if you are using a Televideo 970 or MIME 740 and 04 if you are using a MIME 2a. If you are using a different terminal, or a microcomputer emulating a terminal, type M to see a list of terminals and their appropriate terminal-type codes. After a brief pause, the VM/370 logo will appear on your screen. Press the <RETURN> key. The VM/370 logo will disappear and CP READ will appear in the lower right corner of the screen. Type the words DIAL MUSIC and press the <RETURN> key. When the MUSIC logo appears, press <RETURN> again. You may now sign on as you normally would.

USING THE FULL-SCREEN EDITOR

The first thing that is distinctive about the full-screen editor is that the screen is divided into a display area and a command area. The latter is located below a dashed ruler-line on the bottom of the screen. In the bottom right corner of the screen, you will see the word READING which indicates the system is ready for your input. If you type the command to edit a file as you normally would and press <RETURN>, the line you typed will appear on the display area and the word WORKING will briefly appear in the lower right corner of the screen. Following this, the first 19 lines of your file will appear above the ruler line with an arrow pointing to the first line.

Once the file is displayed on the screen, you can move the cursor to any point on the display area using the arrow keys. At that point, you can delete characters by pressing the DELETE key or replace material by typing over it. To insert material, you need to shift the editor to Insert Mode. This is accomplished by means of an 'escape sequence' which requires that you press the ESCAPE key once or twice followed by one or more other keys. To enter Insert Mode, press the ESCAPE key twice, release it, and press the letter I. To return to Overwrite Mode, press the CONTROL key while simultaneously pressing the letter R.

Each time <RETURN> is pressed, the current screen is stored in memory and the editor is returned to Overwrite Mode. Moving the cursor to any line and pressing <RETURN> moves the arrow to that line and makes it the active line. By pressing the TAB or LINE FEED key to move the cursor to the COMMAND line, you can use any

MUSIC line-editing command (such as change or delete) to alter the active line.

PROGRAM FUNCTION (PF) KEYS

To utilize the full-screen editor to its fullest potential, you must become acquainted with program function or PF keys. These are special keys found on IBM terminals which serve program-specific functions. In the case of the full-screen editor, they greatly facilitate the editing of files. While there are 24 of these PF keys, only about half are used regularly on the editor, so memorizing them is not terribly difficult. PF keys are simulated by use of "escape sequences". The following "universal cheat sheets" present a summary of the most commonly used PF keys, their escape sequences, and their editing function. Note that a detailed explanation of all PF keys can be found in the MUSIC manual on pages 200-202.

<u>FUNCTION</u>	<u>PF Equivalent</u>	<u>ESC Sequence</u>
Up Window (7 lines)	PF 1	ESC 1
Up Page (20 lines)	PF 2	ESC 2
Top of File	PF 3	ESC 3
Down Window	PF 4	ESC 4
Down Page	PF 5	ESC 5
Bottom of File	PF 6	ESC 6

The first six PF keys are the ones most frequently used while editing a file since they, together with the cursor arrow keys, allow you to move to any point within a file. It makes no difference where the cursor is positioned on the screen when typing the escape sequences for PF 1 through PF 6. If, however, you need to use the Next, Up, or Locate commands, you must tab to the command line before issuing the command.

<u>FUNCTION</u>	<u>PF Equivalent</u>	<u>ESC Sequence</u>
Delete Line where Cursor Appears	PF 7	ESC 7
Split Line at Cursor Position	PF 8	ESC 8
Repeat last Locate Command	PF 9	ESC 9
Insert One Blank Line	PF 10	ESC 0
Toggle Input Mode/Edit Mode	PF 11	ESC -
Move Cursor to Command Line	PF 12	ESC =

PF keys 7 through 12 are also relatively easy to utilize. Make certain the cursor is properly positioned before deleting or splitting lines. PF 9 performs a repeat locate which is very useful if you are trying to locate a specific occurrence of a character string, but you are unsure of the location within the file. PF 10 inserts one blank line directly after the line on which the cursor is positioned. PF 11 shifts you from Edit to Input Modes directly after the line on which the cursor is located and shifts you back to Edit Mode from Input Mode. While in Input Mode, make certain that you use the Line Feed or Tab key to advance to the next line. The <RETURN> key should be used only

after typing the last line on the screen to give you a new work area. Finally, PF 12 moves the cursor to the Command line from any point on the screen.

<u>FUNCTION</u>	<u>PF Equivalent</u>	<u>ESC Sequence</u>
Flip Window Display	PF 14	ESC ESC 14
Join Next Line to Current Line	PF 20	ESC ESC 20
Duplicate Current Line	PF 21	ESC ESC 21
Delete to the End of Current Line		ESC ESC E F
To Insert Mode		ESC ESC i
Attention or Break output		ESC ESC P1

The "Flip Window Display" command is needed because the full-screen editor only displays 72 columns at a time. Flipping the window allows you to edit the remaining 8 columns. (NOTE: If you anticipate switching between the full-screen editor and the line editor, it is a good idea to limit your record length to 72 characters to avoid the inconvenience of flipping windows.) PF 20 joins the next line in the file to the one on which the cursor is positioned, while PF 21 duplicates the current line on the line immediately following. Deleting to the end of a line can save time wasted repeatedly pressing the DELETE key. Remember that Insert Mode is toggled back to Overwrite Mode each time you press the <RETURN> key or press CONTROL R. Attention breaks the output of a program temporarily to allow you to cancel if you wish.

While using the full-screen editor, remember that all of the editing commands used on the line editor can be issued from the Command line. Thus, to save a file, you would usually type ESC = to get to the Command line followed by save and <RETURN>. Note also that a summary of all PF keys is available from the Command line by typing SHOW PFK <RETURN>.

Many users, when first exposed to the full-screen editor, consider it to be too complicated when compared to the line editor. However, once you take the short period of time needed to gain proficiency, it is unlikely that you will ever use the line editor again. Your productivity will undoubtedly increase and your frustration level may experience some decline.

NOTE: Academic Computing offers one-hour short courses on full-screen editing. See the schedule elsewhere in this issue. If you experience any difficulties or have questions, contact us at 565-2324.

```
* * * * *  
*           *  
*  V A X E N  *  
*           *  
* * * * *
```

VAX Backup Schedule

Incremental backups of both VAX systems are performed Monday through Thursday at 5 p.m. Any files that have been created or changed are backed up. Users do not have to log out, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday at 5 p.m. Again, users do not have to log out, but any files that are open will NOT be backed up.

A "stand alone" backup of both systems is done on the last working day of the month. During this time, all system software, as well as user files, are backed up. The systems must be taken down for this backup, which will usually not last more than 1/2 hour. All users that are logged on will be warned of the impending backup, and must log out.

NOTE: No backups are taken on the weekends. Requests for restoration of files should be made via MAIL to the username OPERATOR.

VAX Graphics

By K. Stickney, VAX System Manager

Part I: Plotting on the LA100

This is the first of a three-part series about how the VAX computers at NTSU can be used for various types of graphics and plotting tasks. Part I deals with the LA100 hardcopy terminals and their graphics capabilities. Part II describes the large support package DISSPLA which supports many devices, none of which exist yet at NTSU but which are on order and will make up the coming graphics lab. Part III will describe a program being written for the NTSU user community which will allow TI personal computers to implement a subset of the REGIS graphics protocol sufficient to provide support for SASGRAPH and DISSPLA applications. This will allow TI PCs to be used as graphics terminals for applications running on the various multiuser systems.

The LA100, also called the Decwriter IV, is a dot-matrix printer which is in use at NTSU, particularly in the GAB 5th floor public terminal area. Currently they are being used strictly as text terminals, but they have hidden graphics capabilities which may be invoked if the appropriate software is available.

The graphics protocol used by the LA100 is called REGIS Hardcopy Descriptor. It employs an encoding scheme in which the top six wires of the printhead are used to print dots in stripes of six. Each dot grouping one wide and six high is called a "sixel". The encoding scheme is such that all graphics data sent to the printer consists of printable ASCII characters, except for initial and final escape sequences which cause the terminal to enter and exit the graphics mode. This makes it possible to implement software flow control (XON/XOFF), a 7-bit data path, and eases monitoring of the data stream for debugging.

Some discussion is in order concerning the manner in which user programs can control graphics devices. In the simplest scenario, a user program can generate information which causes a specific graphics device to generate the dots, moves, lines, or vectors which cause the desired image to appear. This typically has the limitation of restricting the program to one particular graphics output device. A more flexible approach is to define a device-independent graphics descriptor protocol which can then be translated, scaled, and subsequently output on a large number of devices. One such protocol which has enjoyed successful use for a number of years is the unix PLOT device-independent protocol. In the unix PLOT system, various programs generate a plot file containing byte-encoded descriptions of dots, lines and text which is independent of any particular graphics device. This plot file is then used as input to a plot "filter", a program which is dedicated to translating the plot data for a specific device. Standard plot filters under unix include the Tektronics 4014 protocol (also called PLOT10) and the Versatec raster printer.

Another level of user involvement worth discussing is the program interface. We shall assume that the user/programmer has a clear idea of what needs to be graphically depicted, and is prepared to deal with the programming necessary to specify MOVE and DRAW operations. A MOVE is an instruction to move a "pen" (which may be a plotter or pen, or an electron beam in a CRT display) to a specific location relative to a known origin. Most display and plot devices allow an origin in the lower left-hand corner of the display or plot area, which corresponds to the first quadrant of the Cartesian coordinate system. This would be position 0,0 (X=0, Y=0) and become the point of reference for all subsequent instructions. The actual units used to describe MOVE and DRAW operations varies among various standards, but most utilize either actual dots, or some standard linear measure such as inches or centimeters. Thus, the commands to draw a line from the origin to a point five inches directly to the right on a device having a resolution of 100 dots per inch would be

```
move(0,0);      /* Go to origin */
cont(500,0);    /* Continue (draw) to next location */
```

in the C language using the PLOT subroutine library available

under UNIX. Similarly, using the CALCOMP programming standard in a FORTRAN program,

```
C Go to origin:
      CALL PLOT(0.0, 0.0, 3)
C Continue (draw) to next location:
      CALL PLOT(5.0, 0.0, 2)
```

would do the same thing. Both examples make the assumption that each program call either directly controls a device, or writes a file which will subsequently be directly sent to a device or further interpreted by a plot filter or equivalent program. In terms of our previous reference to the concepts of MOVE and DRAW, note that in the C example "move" corresponds to MOVE and "cont" corresponds to DRAW. In the FORTRAN example, "CALL PLOT" with the third argument equal to 3 corresponds to MOVE while the same call with the third argument equal to 2 corresponds to DRAW. You will also note that in the first example the unit is dots (or pixels), while in the second the unit is inches.

In the VAX environment, the usual way to obtain library functions which do plotting is to link a user program to a function library using the LINK command after compiling your program. In the case of C programs under Eunice, the option "-lplot" is added to the end of the compile, assemble or link command in order to include the plot library which contains such functions as "move" and "cont" just described. In either case the result is the same: object code in the plot library is linked in with the user code whenever a reference is made to a plot routine or function.

The NTSU Computing Center is currently developing and testing software allowing the use of LA100 terminals for graphics output. This software is currently in the Alpha test phase (being tested by the developers) and will soon be ready for Beta testing (testing by other users). If you are interested writing programs which do the kind of low-level graphics described in this article, send VAX mail to OPERATOR stating your interest and referring to this article. Your participation in this software testing will help us to get the most out of our LA100 printers.

EDITOR'S NOTE: The remainder of "Going Places With VAX/VMS", which was in the December issue of BENCHMARKS, will appear in subsequent issues, depending on the arrival of some equipment.

```

* * * * *
*
*   H P - 2 0 0 0
*
* * * * *

```

HP-2000 Backup Schedule

Routine system backups are scheduled to be performed at the following times:

8 a.m. Monday through Friday for approximately 20 minutes;
4 p.m. Friday for approximately 1.5 hours.

```

* * * * *
*
*   I N F O R M A T I O N
*   S Y S T E M S
*
* * * * *

```

NAS/6650 Performance Statistics for December

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
MVS/JES2	744	2.35	741.65	9.07	732.58	98.8%
COMPLETEA	270	2.23	274.77	6.61	268.16	97.6%
ADABASA	744	33.34	710.66	21.38	689.28	97.0%

The AS/6650 CPU and the AS/7360 DASD achieved 100% uptime. Please consult the NAS/8040 Performance Summary for an explanation of cell entries. It can be found under the OPERATIONS section of this newsletter.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

DASD Subsystem (STC)

1. Dual-Porting Failure/Fix on 8650 DASD CU's 4.44 HOURS

Terminal Control Systems (IBM)

1. 3272 TCU Failure 0.43 HOURS

BENCHMARKS

JANUARY, 1985

Miscellaneous

1. MVS/JES2 System Tuning/Improvements	0.96 HOURS
2. ADABASA Program Tuning/Improvements	7.07
3. COMPLETA Program Tuning/Improvements	1.58
4. New Disk DSN Naming Conventions Conversion	11.99
5. SIMS Production Stress Testing	4.58
6. Student Records DASD File Maintenance	4.30
7. Emergency Power Down of all Equipment due to Water Leakage from Roof in GAB Room 560	4.27

TOTAL	34.75 HOURS

GRAND TOTAL	39.62 HOURS

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JANUARY, 1985

Registration Form for Computing Center Short Courses

Please complete this form and return it AS SOON AS POSSIBLE if you wish to attend any of the short courses listed below. You may also register over the phone by calling 565-2324.

NAME: _____ PHONE: _____

DEPT: _____

I wish to attend:

Introduction to MUSIC

- ___ Monday, February 11, 3-5 p.m.
- ___ Tuesday, February 12, 9:30-11:30 a.m.
- ___ Wednesday, February 13, 10 a.m.-Noon
- ___ Friday, February 15, 2-4 p.m.

Introduction to the 3270 Protocol Converter (FULL-SCREEN Editing on MUSIC)

- ___ Tuesday, February 12, 4-5 p.m.
- ___ Wednesday, February 13, 1-2 p.m.
- ___ Friday, February 15, 10-11 a.m.

Introduction to SAS

- ___ Thursday, February 14, 9:30-11:30 a.m.

Introduction to SPSS-X

- ___ Wednesday, February 13, 3-5 p.m.

Introduction to Waterloo SCRIPT

- ___ Thursday, February 14, 6-8 p.m.

Introduction to VAX

- ___ Tuesday, February 12, 1-2 p.m.
- ___ Friday, February 15, 1-2 p.m.

Advanced SAS

- ___ Monday, February 11, 6-8 p.m.

Introduction to BMDP

- ___ Thursday, February 14, 1:30-3:30 p.m.

Introduction to JCL

- ___ Friday, February 15, 1-3 p.m.

PLEASE RETURN TO:
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The Computing Center
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North Texas State University
Denton, TX 76203

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BENCHMARKS is a vital link between the NTSU Computing Center and the users of our facilities. It is important for all users of the computing facilities to maintain a file of these newsletters because they contain materials which will periodically update existing documents as well as information and suggestions on uses of OS/MVS, MUSIC, the VAX 11/780's, the HP-2000, and other resources available to NTSU students and faculty. To facilitate the dispersal of BENCHMARKS, *** FREE *** subscriptions are now available. To receive yours, send the following information to us either by "snail mail" (the post office or campus mail) or electronically, through the MAIL facility on MUSIC.

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